

SMNSR-00-000824-2016.001

**RECEIVED NOV 08 2016**

Chipeta Processing LLC  
P.O. Box 173779, Denver, Colorado 80217-3779  
720-929-6000 Fax 720-929-7000

November 1, 2016

**SENT VIA CERTIFIED MAIL No.:** 7014 2120 0003 6311 0667

Ms. Claudia Smith  
U.S. EPA, Region 8  
1595 Wynkoop Street, 8P-AR  
Denver, CO 80202-1129

**RE: Synthetic Minor NSR Permit Application under Part 49  
East Bench Compressor Station**

Dear Ms. Smith:

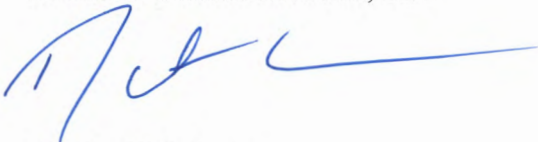
Anadarko Uintah Midstream, LLC (Anadarko) is submitting the attached permit application under Part 49 Minor NSR rules for the East Bench Compressor Station located in Uintah County, Utah. Anadarko is submitting this minor source application to establish federally enforceable limits as required by the Civil Action No. 07-CV-01034-EWN-KMT (KMG Consent Decree).

The attached application contains the following:

- Appendix A: EPA Form New
- Appendix B: EPA Form SYNMIN
- Appendix C: Process Description, Flow Diagram, and Plot Plan
- Appendix D: Emission Unit and Emission Control Descriptions
- Appendix E: Emission Summary
- Appendix F: Detailed Emission Calculations
- Appendix G: Regulatory Analysis

Sincerely,

Anadarko Uintah Midstream, LLC




Natalie Ohlhausen  
Sr. HSE Representative

*Enclosures*

## **Appendix A**

### **Form NEW**

**(Application for New Construction)**

	<b>United States Environmental Protection Agency</b> Program Address Phone Fax Web address	<b>Reviewing Authority</b> Program Address Phone Fax Web address
<b>FEDERAL MINOR NEW SOURCE REVIEW PROGRAM IN INDIAN COUNTRY</b>  <b>Application for New Construction</b> (Form NEW)		
<p>Please check all that apply to show how you are using this form:</p> <p><input type="checkbox"/> Proposed Construction of a New Source <input type="checkbox"/> Proposed Construction of New Equipment at an Existing Source <input type="checkbox"/> Proposed Modification of an Existing Source <input checked="" type="checkbox"/> Other – Please Explain</p> <p>Existing Source operating under synthetic minor limits, as regulated under Consent Decree, submitting an application for a synthetic minor permit under Part 49.</p>		

**Please submit information to:**

Ms. Claudia Smith  
U.S. EPA Region 8  
1595 Wynkoop Street, 8P-AR  
Denver, CO 80202-1129

**A. GENERAL SOURCE INFORMATION**

1. (a) <b>Company Name</b> Anadarko Uintah Midstream LLC		2. <b>Source Name</b> East Bench Compressor Station	
(b) <b>Operator Name</b> Anadarko Uintah Midstream LLC			
3. Type of Operation Nat.Gas Compression & Transmission		4. Portable Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 5. Temporary Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
6. NAICS Code		7. SIC Code 1311	
8. Physical Address (home base for portable sources)			
9. Reservation* Uintah and Ouray	10. County* Uintah	11a. Latitude* 39.907616° N	11b. Longitude* -109.466166 °
12a. Quarter Quarter Section* SE NW	12b. Section* 32	12c. Township* 10S	12d. Range* 22E

\*Provide all proposed locations of operation for portable sources

**B. PREVIOUS PERMIT ACTIONS** (Provide information in this format for each permit that has been issued to this source. Provide as an attachment if additional space is necessary)

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

Source Name on the Permit
Permit Number (xx-xxx-xxxxx-xxxx.xx)
Date of the Permit Action

### C. CONTACT INFORMATION

<b>Company Contact</b> Mike Weaver		Title Midstream Operations Manager	
Mailing Address P.O.Box 173779, Denver, CO 80202-3779			
Email Address Mike.Weaver@anadarko.com			
Telephone Number 720-929-6792		Facsimile Number	
<b>Operator Contact</b> (if different from company contact) Andy Zeller			Title Plant Foreman
Mailing Address			
Email Address andy.zeller@anadarko.com			
Telephone Number 435-781-7001		Facsimile Number	
<b>Source Contact</b> Natalie Ohlhausen			Title Sr. HSE Representative
Mailing Address P.O.Box 173779, Denver, CO 80202-3779			
Email Address Natalie.Ohlhausen@Anadarko.com			
Telephone Number 720-929-6498		Facsimile Number	
<b>Compliance Contact</b> Same as Source Contact		Title	
Mailing Address			
Email Address			
Telephone Number		Facsimile Number	

#### D. ATTACHMENTS

**Include all of the following information** (see the attached instructions)

☒ **FORM SYNMIN** - New Source Review Synthetic Minor Limit Request Form, if synthetic minor limits are being requested.

☒ Narrative description of the proposed production processes. This description should follow the flow of the process flow diagram to be submitted with this application.

☒ Process flow chart identifying all proposed processing, combustion, handling, storage, and emission control equipment.

☒ A list and descriptions of all proposed emission units and air pollution-generating activities.

☒ Type and quantity of fuels, including sulfur content of fuels, proposed to be used on a daily, annual and maximum hourly basis.

☒ Type and quantity of raw materials used or final product produced proposed to be used on a daily, annual and maximum hourly basis.

☒ Proposed operating schedule, including number of hours per day, number of days per week and number of weeks per year.

☒ A list and description of all proposed emission controls, control efficiencies, emission limits, and monitoring for each emission unit and air pollution generating activity.

☒ **Criteria Pollutant Emissions** - Estimates of Current Actual Emissions, Current Allowable Emissions, Post-Change Uncontrolled Emissions, and Post-Change Allowable Emissions for the following air pollutants: particulate matter, PM<sub>10</sub>, PM<sub>2.5</sub>, sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, fluorides (gaseous and particulate), sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>), hydrogen sulfide (H<sub>2</sub>S), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates.

These estimates are to be made for each emission unit, emission generating activity, and the project/source in total.

☐ **Modeling – Air Quality Impact Analysis (AQIA)**

☐ **ESA (Endangered Species Act)**

☐ **NHPA (National Historic Preservation Act)**

## E. TABLE OF ESTIMATED EMISSIONS

The following tables provide the total emissions in tons/year for all pollutants from the calculations required in Section D of this form, as appropriate for the use specified at the top of the form.

### E(i) – Proposed New Source

Pollutant	Potential Emissions (tpy)	Proposed Allowable Emissions (tpy)	
PM		0.0	PM - Particulate Matter PM <sub>10</sub> - Particulate Matter less than 10 microns in size PM <sub>2.5</sub> - Particulate Matter less than 2.5 microns in size SO <sub>x</sub> - Sulfur Oxides NO <sub>x</sub> - Nitrogen Oxides CO - Carbon Monoxide VOC - Volatile Organic Compound Pb - Lead and lead compounds Fluorides - Gaseous and particulates H <sub>2</sub> SO <sub>4</sub> - Sulfuric Acid Mist H <sub>2</sub> S - Hydrogen Sulfide TRS - Total Reduced Sulfur RSC - Reduced Sulfur Compounds
PM <sub>10</sub>		0.0	
PM <sub>2.5</sub>		0.0	
SO <sub>x</sub>			
NO <sub>x</sub>		39.0	
CO		15.5	
VOC		11.5	
Pb			
CO <sub>2e</sub>		11621.0	
Fluorides			
H <sub>2</sub> SO <sub>4</sub>			
H <sub>2</sub> S			
TRS			
RSC			

Emissions calculations must include fugitive emissions if the source is one the following listed sources, pursuant to CAA Section 302(j):


- (a) Coal cleaning plants (with thermal dryers);
- (b) Kraft pulp mills;
- (c) Portland cement plants;
- (d) Primary zinc smelters;
- (e) Iron and steel mills;
- (f) Primary aluminum ore reduction plants;
- (g) Primary copper smelters;
- (h) Municipal incinerators capable of charging more than 250 tons of refuse per day;
- (i) Hydrofluoric, sulfuric, or nitric acid plants;
- (j) Petroleum refineries;
- (k) Lime plants;
- (l) Phosphate rock processing plants;
- (m) Coke oven batteries;
- (n) Sulfur recovery plants;
- (o) Carbon black plants (furnace process);
- (p) Primary lead smelters;
- (q) Fuel conversion plants;
- (r) Sintering plants;
- (s) Secondary metal production plants;
- (t) Chemical process plants
- (u) Fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input;
- (v) Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels;
- (w) Taconite ore processing plants;
- (x) Glass fiber processing plants;
- (y) Charcoal production plants;
- (z) Fossil fuel-fired steam electric plants of more that 250 million British thermal units per hour heat input, and
- (aa) Any other stationary source category which, as of August 7, 1980, is being regulated under section 111 or 112 of the Act.

**Appendix B**

**Form SYNMIN**

**(Application for Synthetic Minor Limit)**



 <p>United States Environmental Protection Agency Program Address Phone Fax Web address</p>	<p>Reviewing Authority Program Address Phone Fax Web address</p>
<p><b>FEDERAL MINOR NEW SOURCE REVIEW PROGRAM IN INDIAN COUNTRY</b></p> <p><b>Application For Synthetic Minor Limit</b> (Form SYNMIN)</p>	

Please submit information to:

Ms. Claudia Smith  
U.S. EPA Region 8  
Air and Toxics Division  
1595 Wynkoop  
Denver, CO 80202-1129

**A. GENERAL INFORMATION**

Company Name Anadarko Uintah Midstream LLC		Source Name East Bench Compressor Station	
Company Contact or Owner Name Mike Weaver		Midstream	Title Operations Manager
Mailing Address P.O.Box 173779, Denver, CO 80202-3779			
Email Address Mike.Weaver@anadarko.com			
Telephone Number 720-929-6792		Facsimile Number	

**B. ATTACHMENTS**

**For each criteria air pollutant, hazardous air pollutant and for all emission units and air pollutant-generating activities to be covered by a limitation, include the following:**

- ☒ **Item 1** - The proposed limitation and a description of its effect on current actual, allowable and the potential to emit.
- ☒ **Item 2** - The proposed testing, monitoring, recordkeeping, and reporting requirements to be used to demonstrate and assure compliance with the proposed limitation.
- ☐
- ☒ **Item 3** - A description of estimated efficiency of air pollution control equipment under present or anticipated operating conditions, including documentation of the manufacturer specifications and guarantees.
- ☐
- ☒ **Item 4** - Estimates of the Post-Change Allowable Emissions that would result from compliance with the proposed limitation, including all calculations for the estimates.
- ☒ **Item 5** - Estimates of the potential emissions of Greenhouse Gas (GHG) pollutants:

## **Appendix C**

### **Process Description, Process Flow Diagram, & Plot Plan**

### **Process Description**

Anadarko Uintah Midstream LLC (Anadarko) owns and operates the East Bench Compressor Station (East Bench), within the exterior boundaries of the Uintah and Ouray Indian Reservation, in Uintah County, Utah.

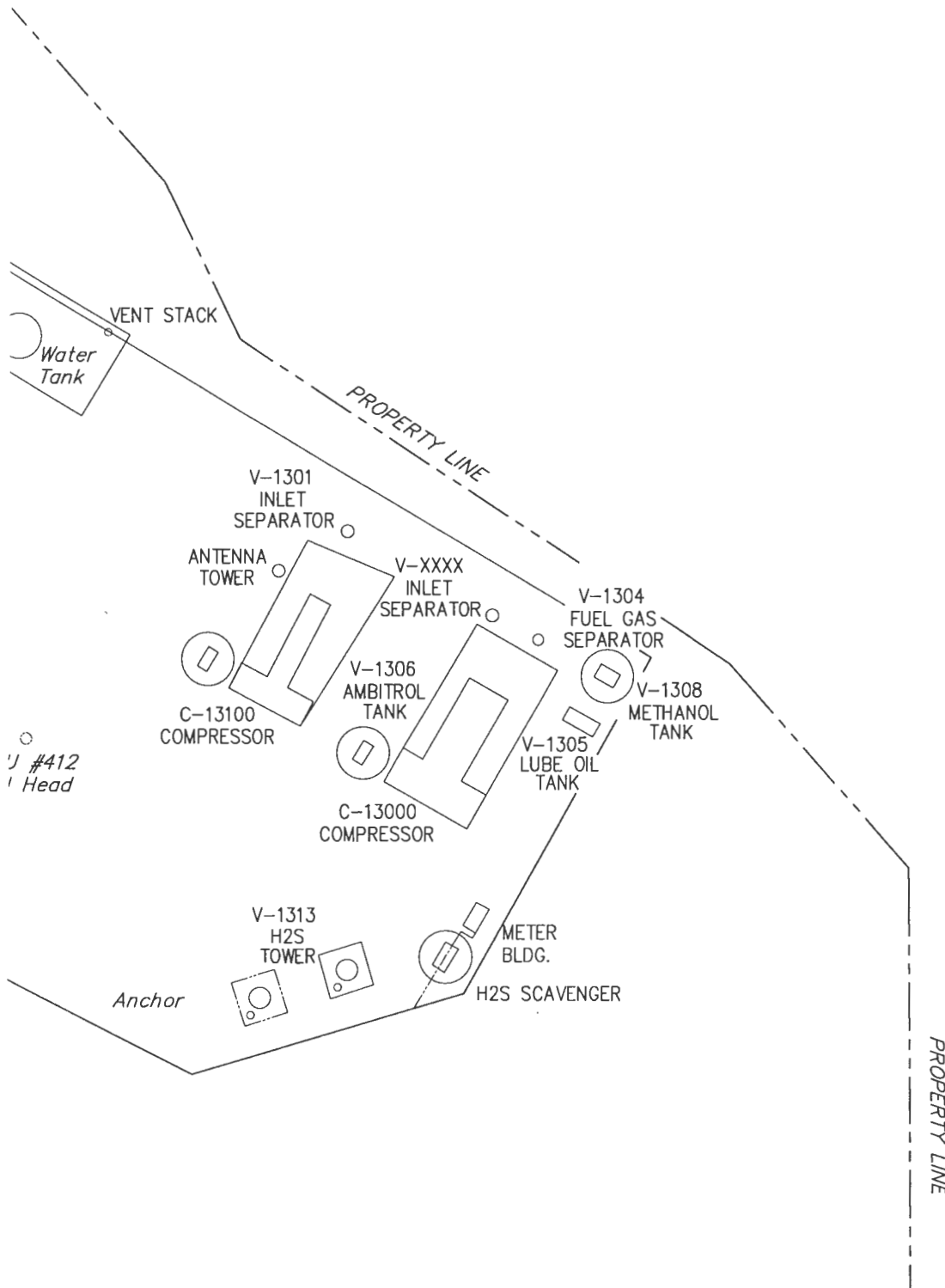
Natural gas from the surrounding field is routed to the compressor station via the gas collection system. Natural gas enters the compressor station through the inlet slug catcher where liquids are gravitationally separated from the stream. Condensate recovered is sent to the atmospheric storage tanks. Gas goes through two stages of compression before discharge from the facility. Water is stored in the atmospheric storage tanks along with condensate collected. Liquids are held in storage tanks onsite until loaded into trucks for transport to sale.

Bonanza East operations consists of:

- Two Caterpillar G3516 compressor engines (EAB 1 and EAB 2),
- Two produced water tanks (Tanks-1302 and 1303)
- One truck loading area
- One 0.25 MMBtu/hr line heater
- Piping components (FUG)

V-1317  
DISCH. SEP.

V-1318  
H<sub>2</sub>S STRIPPER



3/28/15					
5/19/12					
7/29/08					
8/27/05					
DATE	CHK.	DATE	APPR.	DATE	



**EAST BENCH COMPRESSOR STATION**

**PLOT PLAN**

DRAWN BY: JS  
APPROVED: -

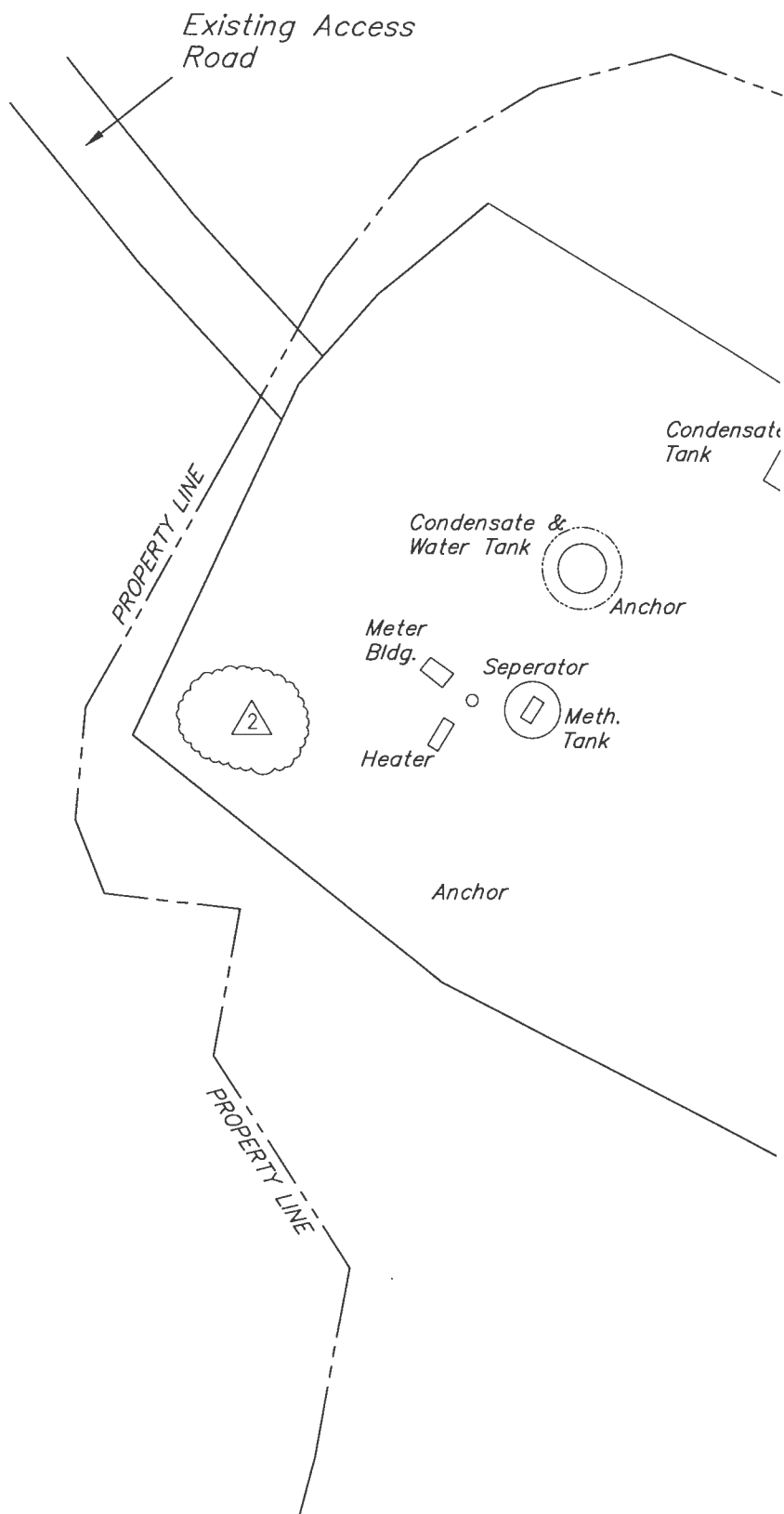
CREATION DATE: 8/30/04  
APPR. DATE:  
DWG. No.:

AFE No.:

SCALE: NONE

**U13-QP-01**

SHEET No. 2  
- OF -



NOTES:	REFERENCE DRAWINGS		REVISIONS	
			△	REMOVED LAUNCHER PER M.O.C. 3224
			△	AS-BUILT
			△	ISSUED AS-BUILT
			△	FOR REVIEW
	DWG. NO.	TITLE	NO.	DESCRIPTION

TK-1302 & TK-1303

CONDENSATE  
STORAGE TANKS

V-1315

DISCHARGE SEPARATOR

T-1316

H<sub>2</sub>S STRIPPER

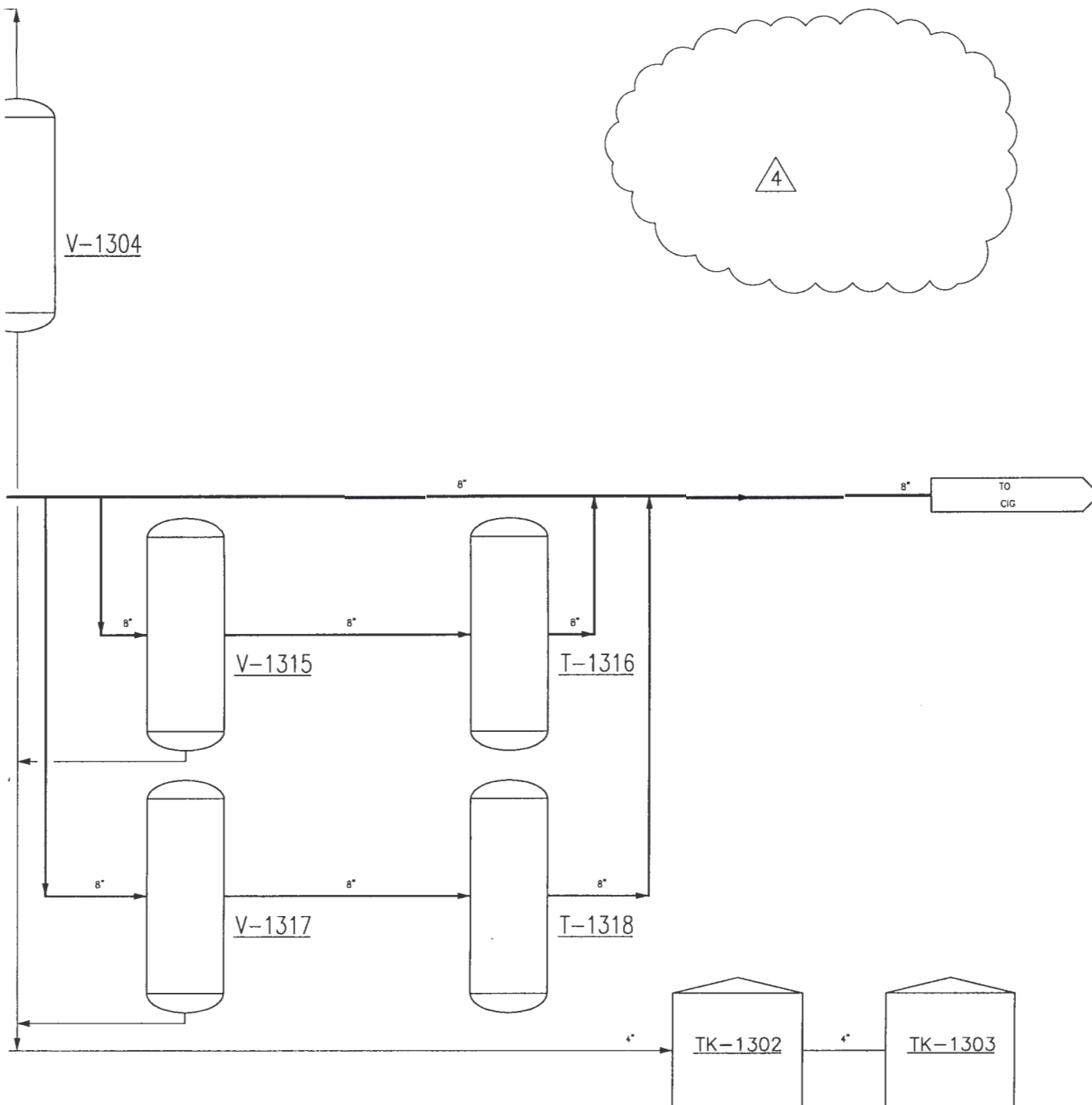
V-1317

DISCHARGE SEPARATOR

T-1318

H<sub>2</sub>S STRIPPER

V-1304



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12/31/15					

**Anadarko**  
Petroleum Corporation

EAST BENCH COMPRESSOR STATION

**EAST BENCH COMPRESSOR STATION**  
PIPING AND INSTRUMENTATION DIAGRAM  
PROCESS FLOW DIAGRAM

DRAWN BY: JES

APPROVED: -

SCALE: NONE

CREATION DATE: 8/30/04

APPR. DATE:

DWG. No.:

AFE No.:

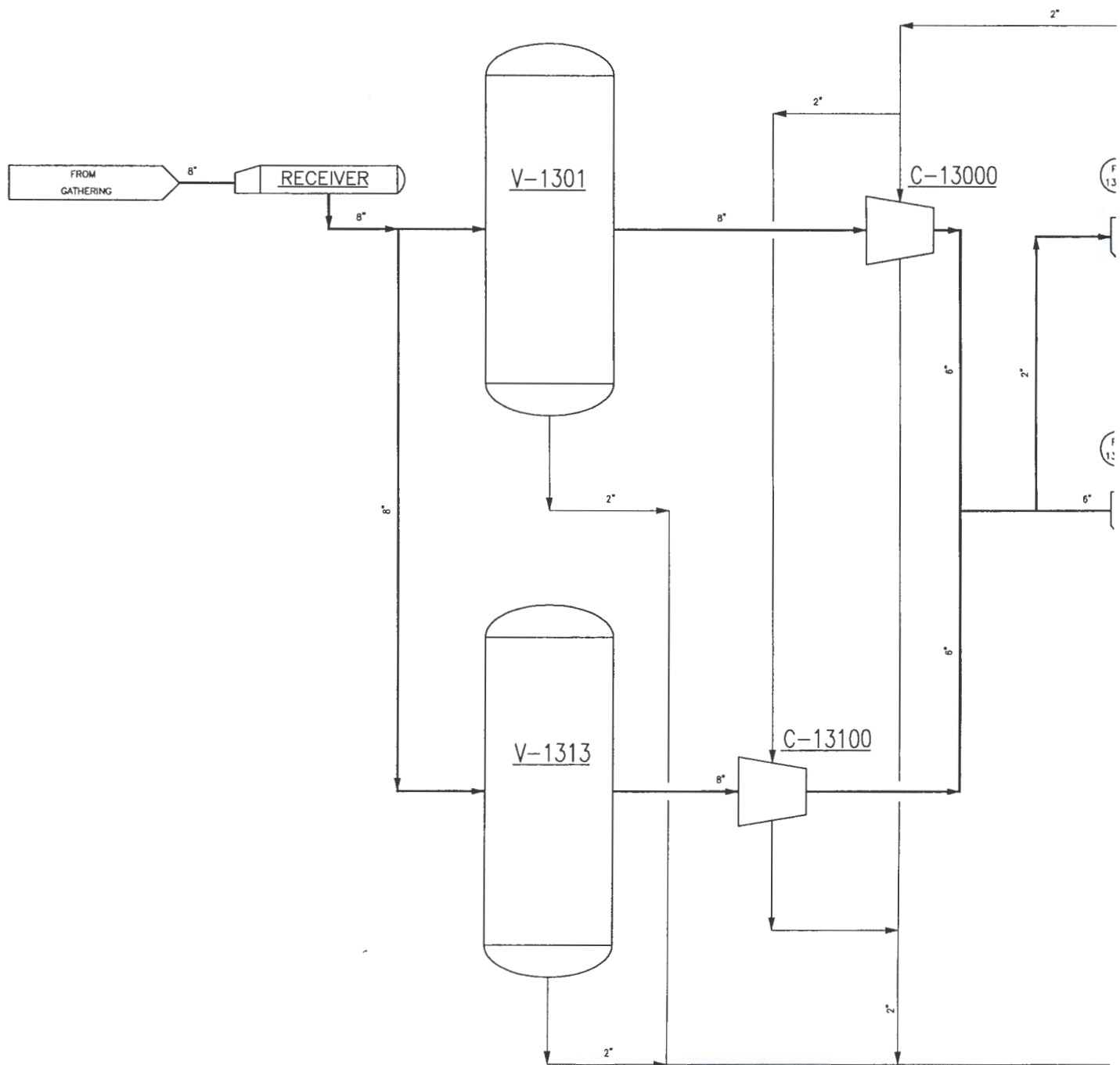
U13-PFD-01

SHEET No.

- OF -



V-1304  
FUEL GAS SEPARATOR



THIS DRAWING AND THE DESIGN IT CONTAINS ARE CONFIDENTIAL AND REMAIN THE PROPERTY OF ANADARKO PETROLEUM CORPORATION AND SHALL NOT BE DISCLOSED TO OTHERS OR REPRODUCED IN ANY MANNER OR USED FOR ANY PURPOSE WHATSOEVER EXCEPT BY WRITTEN PERMISSION BY THE OWNER.

NOTES:

REFERENCE DRAWINGS		REVISIONS	
		4	REMOVED LAUNCHER PER M.O.C. 3224
		3	AS-BUILT
		2	ISSUED AS-BUILT
		1	AS-BUILT
		1	AS-BUILT
DWG. NO.	TITLE	NO.	DESCRIPTION

## **Appendix D**

### **Emission Unit Description**



### CO Emissions:

As per the Kerr-McGee (“KMG”) Consent Decree, KMG is requesting to make the emission limits outlined in paragraphs 41 and 50 federal enforceable as required by paragraph 167. All engines located at the Bonanza East Compressor Station are fitted with oxidation catalyst which demonstrate a control efficiency of 93% is required for these RICEs as per the Kerr-McGee Consent Decree (*paragraphs 41 and 50*).

KMG is requesting the control requirements for CO in the Consent Decrees be incorporated as permit conditions.

- Proposed limits

CO emission control efficiency of 93% for Engines EAB 1, EAB 2

- Proposed testing

- Initial Testing

- Swap-outs and Like-kind Replacement Engines

- Initial compliance test shall be conducted within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup.

- Test Methods:

- Measure the O<sub>2</sub> and CO at the outlet of the control device using portable analyzer. Use ASTM D6522-00 (2005), Method 10 of 40 CFR appendix A, or some other EPA approved Method for CO.  
Measurements to determine O<sub>2</sub> must be made at the same time as the measurements for CO concentration.
      - Convert to g/hp-hr using Method 19 and the manufacturer’s specific fuel consumption or measured fuel consumption and horsepower at the time of the testing.
      - Conduct one (1) test run for each performance test required. Each test run must last at least 21 minutes

- Ongoing Testing

- Semi-annual or annual testing must be completed to verify compliance with g/hp-hr limits. Existing engines currently follow a semi-annual testing schedule. After permit issuance, if there is documented history of two consecutive, passing compliance tests, the testing frequency shall be reduced to annually. Overall, the testing frequency will not be reduced to annual tests until there are two consecutive, passing compliance tests (taking into account pre-permit, compliant tests). Total facility CO emissions shall be calculated based on the results of the latest test and 8,760 hours per year of operation. Should there be a failed test, testing will resort to semi-annual testing. Two

compliant semi-annual tests will be required before reverting to annual testing. Semi-annual tests must be completed within 180 days of permit issuance and annual tests must be completed within 365 days of permit issuance. Subsequent semi-annual and annual tests must occur anytime within the January to June and July to December semi-annual period or calendar year period, for semi-annual and annual testing, respectively. This means there will be instances where the time in between semi-annual tests may exceed 180 days and the time in between annual tests may exceed 365 days.

- Test Methods:
  - Measure the O<sub>2</sub> and CO at the outlet of the control device using portable analyzer. Use ASTM D6522-00 (2005), Method 10 of 40 CFR appendix A, or some other EPA approved Method for CO. Measurements to determine O<sub>2</sub> must be made at the same time as the measurements for CO concentration.
  - Convert to g/hp-hr using Method 19 and the manufacturer's specific fuel consumption or measured fuel consumption and horsepower at the time of the testing.
  - Conduct one (1) test run for each performance test required. Each test run must last at least 21 minutes
- Reporting Requirements
  - Notification of performance test shall be submitted 30 days prior to the date of the performance test.
  - Test reports shall be submitted within 60 days of completion of any compliance test.
- Operation and Maintenance Requirements
  - At all times, the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.

#### Formaldehyde Emissions:

- This facility is a not major source of HAPs and is therefore not subject to the major source requirements of NESHAP Subpart ZZZZ. Therefore, no limits are being requested.

#### NOx Emissions:

- This facility NOx emissions are below the PSD threshold and, therefore, no limits are being requested.

VOC Emissions:

- Engines
  - VOC emissions based off manufacture's information. Total facility emissions are below the PSD threshold and, therefore, no limits are being requested.
- Produced Water Tanks
  - The produced water tanks at this station collect minimal condensate volumes. The VOC emissions from each tank are estimated based on process model to less than 6tpy.
  - Recordkeeping
    - Shall maintain records and information adequate to demonstrate its compliance with the requirements of this permit for five years.
- Pneumatic Controllers
  - Permit Limit:
    - All pneumatic controllers shall be "low bleed" controllers.

## **Appendix E**

### **Emission Summary**

**Facility:** East Bench Compressor Station

**Location:** Section 32 T10S R22E

Uncontrolled Emissions (TPY)											
Unit ID	Description	NOx	CO	VOC	PM10	CO2e	CH2O	Acetaldehyde	Benzene	Acrolein	HAPS TOT
EAB 1	G3516TALE	19.4	110.0	4.3	0.0	5784.1	3.8	0.36	0.02	0.22	4.36
EAB 2	G3516TALE	19.4	110.0	4.3	0.0	5784.1	3.8	0.36	0.02	0.22	4.36
TK 1-2	Tank Emissions	-	-	5.1	-	52.9	-	-	0.07	-	0.75
L-1	Tank Truck Loading	-	-	Insig.	-	-	-	-	-	-	-
HTR 1	Line Heater	0.2	0.1	Insig.	-	160.1	-	-	-	-	-
FUG	Fugitives	-	-	2.9	-	-	-	-	-	-	-
Total		39.0	220.1	13.6	0.0	11781.1	7.5	0.7	0.1	0.4	9.5

PTE Emissions (TPY)											
Unit ID	Description	NOx	CO	VOC	PM10	CO2e	CH2O	Acetaldehyde	Benzene	Acrolein	HAPS TOT
EAB 1	G3516TALE	19.4	7.7	3.2	0.0	5784.1	0.9	0.36	0.02	0.22	1.51
EAB 2	G3516TALE	19.4	7.7	3.2	0.0	5784.1	0.9	0.36	0.02	0.22	1.51
TK 1-2	Tank Emissions	-	-	5.1	-	52.9	-	-	0.07	-	0.75
L-1	Tank Truck Loading	-	-	Insig.	-	-	-	-	-	-	-
HTR 1	Line Heater	0.2	0.1	Insig.	-	0.0	-	-	-	-	-
FUG	Fugitives	-	-	2.9	-	-	-	-	-	-	-
Total		39.0	15.5	11.5	0.0	11621.0	1.8	0.7	0.1	0.4	3.8

Per guidance, PTE accounts for legally and practically enforceable restrictions (emission controls).

## **Appendix F**

### **Detailed Emission Calculation**

**East Bench Compressor Station**  
**Engine Detail Sheet**

Source ID Number **EAB 1**  
Source Description 4-Cycle Lean Burn  
Engine Usage Compressor Engine  
Engine Make Caterpillar Potential operation 8760 hr/yr  
Engine Model G3516TALE  
Serial Number 4EK01191 Manufacture Date 12/13/1996  
Date in Service 5/9/2014 Potential fuel usage 96.2 MMscf/yr  
Emission Controls Lean Burn 10979 scf/hr  
Oxidation Catalyst/AFR

Stack ID **EAB 1**  
Engine Rating 1340 BHP Stack Height ft  
Fuel Heating Value 905.0 Btu/scf Stack Diameter 1.0 ft  
Heat Rate 9.94 MMBtu/hr Exit Velocity 78.4 ft/s  
Engine Heat Rate 7415 Btu/hp-hr Exit Temperature 840 deg F  
Volume Flow Rate 3,690 ft³/min

**Uncontrolled Emissions**

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	<b>19.4</b>	Manuf. Data
CO	2.53	8.50	25.11	<b>110.0</b>	Manuf. Data
VOC	0.10	0.33	0.97	<b>4.3</b>	Manuf. Data
SOx	5.88E-04	0.002	0.01	<b>0.03</b>	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2
CO2e	132.9	447.0210	1320.56	<b>5784.07</b>	GHG Subpart C Calc.
<b>HAPs</b>					lb/yr
HCHO	0.09	0.29	0.86	<b>3.75</b>	Manuf. Data 7504.8
Benzene	4.40E-04	0.0015	0.004	<b>0.02</b>	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	<b>0.22</b>	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	<b>0.36</b>	AP-42, Table 3.2-2 727.7
				<b>4.36</b>	

**PTE Emissions**

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)	
NOx	0.45	1.50	4.43	<b>19.4</b>	Manuf. Data
CO*	0.18	0.60	1.76	<b>7.7</b>	Manuf. Control Data
VOC*	0.07	0.25	0.73	<b>3.2</b>	Manuf. Data
SOx	5.88E-04	0.002	0.01	<b>0.03</b>	AP-42, Table 3.2-2
PM10	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2
PM2.5	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2
<b>HAPs</b>					
HCHO*	0.02	0.07	0.21	<b>0.90</b>	Manuf. Control Data 1801.2
Benzene	4.40E-04	0.0015	0.004	<b>0.02</b>	AP-42, Table 3.2-2 38.3
Acrolein	5.14E-03	0.0173	0.051	<b>0.22</b>	AP-42, Table 3.2-2 447.4
Acetaldehyde	8.36E-03	0.0281	0.083	<b>0.36</b>	AP-42, Table 3.2-2 727.7

\*CO: 93% Control Efficiency; VOC: 25% Control Efficiency; Formaldehyde: 76% Control Efficiency

**East Bench Compressor Station**  
**Engine Detail Sheet**

Source ID Number	<b>EAB 2</b>		
Source Description	4-Cycle Lean Burn		
Engine Usage	Compressor Engine		
Engine Make	Caterpillar	Potential operation	8760 hr/yr
Engine Model	G3516TALE		
Serial Number	4EK00587	Manufacture Date	8/28/1995
Date in Service	3/28/2014	Potential fuel usage	96.2 MMscf/yr
Emission Controls	Lean Burn		10979 scf/hr
	Oxidation Catalyst/AFR		
		Stack ID	<b>EAB 2</b>
Engine Rating	1340 BHP	Stack Height	ft
Fuel Heating Value	905.0 Btu/scf	Stack Diameter	1.0 ft
Heat Rate	9.94 MMBtu/hr	Exit Velocity	78.4 ft/s
Engine Heat Rate	7415 Btu/hp-hr	Exit Temperature	840 deg F
		Volume Flow Rate	3,690 ft <sup>3</sup> /min

**Uncontrolled Emissions**

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor	
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		
NOx	0.45	1.50	4.43	<b>19.4</b>	Manuf. Data	
CO	2.53	8.50	25.11	<b>110.0</b>	Manuf. Data	
VOC	0.10	0.33	0.97	<b>4.3</b>	Manuf. Data	
SOx	5.88E-04	0.002	0.01	<b>0.03</b>	AP-42, Table 3.2-2	
PM10	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2	
PM2.5	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2	
CO2e	132.9	447.0	1320.6	<b>5784.1</b>	GHG Subpart C Calc.	
<b>HAPs</b>						lb/yr
HCHO	0.09	0.29	0.86	<b>3.75</b>	Manuf. Data	7504.8
Benzene	4.40E-04	0.0015	0.004	<b>0.02</b>	AP-42, Table 3.2-2	38.3
Acrolein	5.14E-03	0.0173	0.051	<b>0.22</b>	AP-42, Table 3.2-2	447.4
Acetaldehyde	8.36E-03	0.0281	0.083	<b>0.36</b>	AP-42, Table 3.2-2	727.7
				4.36		

**PTE Emissions**

Pollutant	Emission Factor		Estimated Emissions		Source of Emission Factor	
	(lb/MMBtu)	(g/hp-hr)	(lb/hr)	(tpy)		
NOx	0.45	1.50	4.43	<b>19.4</b>	Manuf. Data	
CO*	0.18	0.60	1.76	<b>7.7</b>	Manuf. Control Data	
VOC*	0.07	0.25	0.73	<b>3.2</b>	Manuf. Data	
SOx	5.88E-04	0.002	0.01	<b>0.03</b>	AP-42, Table 3.2-2	
PM10	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2	
PM2.5	7.71E-05	0.0003	0.00	<b>0.00</b>	AP-42, Table 3.2-2	
<b>HAPs</b>						
HCHO*	0.02	0.07	0.21	<b>0.90</b>	Manuf. Control Data	1801.2
Benzene	4.40E-04	0.0015	0.004	<b>0.02</b>	AP-42, Table 3.2-2	38.3
Acrolein	5.14E-03	0.0173	0.051	<b>0.22</b>	AP-42, Table 3.2-2	447.4
Acetaldehyde	8.36E-03	0.0281	0.083	<b>0.36</b>	AP-42, Table 3.2-2	727.7

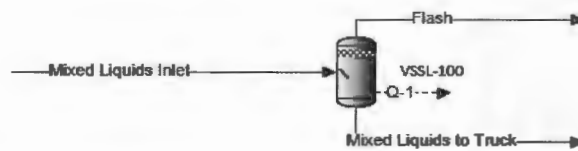
\*CO: 93% Control Efficiency; VOC: 25% Control Efficiency; Formaldehyde: 76% Control Efficiency



Names	Units	Flash
Carbon Dioxide(Mass Flow)	ton/yr	0.35
Methane(Mass Flow)	ton/yr	2.5
Benzene(Mass Flow)	ton/yr	0.074
Toluene(Mass Flow)	ton/yr	0.056
Ethylbenzene(Mass Flow)	ton/yr	0.0023
p-Xylene(Mass Flow)	ton/yr	0.01
n-Hexane(Mass Flow)	ton/yr	0.61

Annual tank loss calculations for "Mixed Liquids Inlet".  
Flashing losses are 5.075 ton/yr.  
\* Only Non-Exempt VOC are reported.

Tank-



Names	Units	Mixed Liquids Inlet	Flash	Mixed Liquids to Truck
Carbon Dioxide(Mole Fraction)	%	0.0073	2.7	0.0015
Nitrogen(Mole Fraction)	%	7.7e-05	0.036	6e-07
Methane(Mole Fraction)	%	0.12	54	0.0024
Ethane(Mole Fraction)	%	0.025	11	0.0021
Propane(Mole Fraction)	%	0.028	10	0.0064
i-Butane(Mole Fraction)	%	0.013	3.5	0.0058
n-Butane(Mole Fraction)	%	0.026	5.7	0.014
i-Pentane(Mole Fraction)	%	0.024	2.8	0.016
n-Pentane(Mole Fraction)	%	0.028	2.5	0.022
Hexane(Mole Fraction)	%	0.1	0.9	0.1
n-Octane(Mole Fraction)	%	0.083	0.21	0.063
Nonane(Mole Fraction)	%	0.013	0.0094	0.013
C10 +(Mole Fraction)	%			
Benzene(Mole Fraction)	%	0.014	0.33	0.013
Toluene(Mole Fraction)	%	0.028	0.21	0.026
Ethylbenzene(Mole Fraction)	%	0.0033	0.0075	0.0033
p-Xylene(Mole Fraction)	%	0.014	0.033	0.014
n-Hexane(Mole Fraction)	%	0.088	2.4	0.063
Liquid Volumetric Flow	bbld	53.04	132.7	39.79

Annual tank loss calculations for "Mixed Liquids Inlet".  
Total working and breathing losses from the Vertical Cylinder are 0.01015 ton/yr.  
Loading losses are 0.004745 ton/yr of loaded liquid.  
\* Only Non-Exempt VOC are reported.

Tank

**East Bench Compressor Station  
Annual Condensate Throughput**

		Condensate Production	Average Production	Water Production	Average Production	Combined Production	Average Production
Year	Month	bbls/month	bbls/day	bbls/month	bbls/day	bbls/month	bbls/day
2014	Jan	70	2	1020	33	1090	36.3
	Feb	250	9	1180	38	1430	47.7
	Mar	0	0	720	23	720	24.0
	Apr	0	0	160	5	160	5.3
	May	0	0	0	0	0	0.0
	Jun	0	0	0	0	0	0.0
	Jul	0	0	0	0	0	0.0
	Aug	0	0	0	0	0	0.0
	Sep	0	0	0	0	0	0.0
	Oct	0	0	0	0	0	0.0
	Nov	0	0	0	0	0	0.0
	Dec	0	0	0	0	0	0.0
2015	Jan	0	0	0	0	0	0.0
	Feb	0	0	640	0	640	21.3
	Mar	153	5	1040	0	1193	39.8
	Apr	40	0	360	0	400	13.3
	May	0	0	240	0	240	8.0
	Jun	0	0	240	0	240	8.0
	Jul	0	0	0	0	0	0.0
	Aug	0	0	80	0	80	2.7
	Sep	0	0	0	0	0	0.0
	Oct	0	0	0	0	0	0.0
	Nov	0	0	0	0	0	0.0
	Dec	0	0	0	0	0	0.0
Average Daily Production			0		0		6

Max 2015 Avg Daily Production

39.8

East Bench Compressor Station  
Heater Emission Calculation Sheet  
Insignificant Source

Heater Data	
ID	HTR 1
Description	Line Heater
Nameplate Rating:	0.25 (MMBtu/hr)
Efficiency:	0.80 (decimal)
Heat Input:	0.31 (MMBtu/hr)
Operation:	8760 (hr/yr)
Fuel Heat Value:	1200.0 (Btu/scf)
VOC Wt Fraction:	0.07 (decimal, VOC weight fraction of the fuel gas)

Emission Factors				
	NO <sub>x</sub>	CO	TOC	CH <sub>2</sub> O
lb/MMscf	100	84	11	0.075
Adjusted lb/MMscf *	117.6	87.7	12.9	0.09
lb/MMBtu	0.115	0.086	0.013	0.000

\* Emission factor conversion based on footnote "a" of AP-42 Table 1.4-1 to convert from 1,020 Btu/scf to the above Fuel Heat Value in units of Btu/scf.

Emission Calculations							
NO <sub>x</sub>		CO		VOC		CH <sub>2</sub> O	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
0.04	0.16	0.03	0.12	0.00	0.00	0.00	0.00

CO <sub>2</sub> e Emission Calculations			
<b>Conversions:</b>			
1 Metric Ton =	2204.62	lbs	
1 kg =	0.001	metric tons	
Pollutant	kg/mmbtu	metric ton	tpy
CO <sub>2</sub>	53.02	145	159.99
CH <sub>4</sub>	0.001	0.0	0.00
N <sub>2</sub> O	0.0001	0.0	0.00
CO <sub>2</sub> e =			160
CO <sub>2</sub> e = CO <sub>2</sub> + (CH <sub>4</sub> *21) + (N <sub>2</sub> O*310)			

East Bench Compressor Station  
Fugitives Detail Sheet

Component Source Counts for Gas Plant/Compressor Station Units

Equipment Type	Compressor	Separator	Condensate Tank	TEG Unit	DEA Unit	C3 Refrig Skid	Expan Demeth	Mole Sieve System	Flare
For this facility, Number of Units	2	6	2	0	0	0	0	0	0
Valves - Inlet Gas	40	6	4	75	15	40	40	25	8
Valves - Liquid	5	4	6	20	60	35	35	0	2
Relief Valves	2	2	2	4	4	6	6	4	2
Pump Seals - Liquid	0	0	2	4	4	0	0	0	0
Flanges/Connectors - Inlet Gas	150	50	50	250	250	250	250	100	75
Flanges/Connectors - Liquid	10	10	10	20	20	20	20	20	10
Compressor Seals	4	0	0	0	0	6	0	0	0

Fugitives

Equipment Type	Emission Factor (lb/hr/source)	Source Count*	% VOC C3+	%HAP	VOC Emission Rate (lb/hr)	HAP Emission Rate (lb/hr)	HAP Emission Rate (tpy)	VOC Emission Rate (tpy)
Valves - Inlet Gas	0.00992	124	11.40%	0.12%	0.140	0.001	0.006	0.61
Valves - Liquid	0.00550	46	100.00%	11.40%	0.253	0.029	0.126	1.11
Relief Valves	0.01940	20	11.40%	0.12%	0.044	0.000	0.002	0.19
Pump Seals - Liquid	0.02866	4	100.00%	11.40%	0.115	0.013	0.057	0.50
Flanges/Connectors - Inlet Gas	0.00086	700	11.40%	0.12%	0.069	0.001	0.003	0.30
Flanges/Connectors - Liquid	0.00024	100	100.00%	11.40%	0.024	0.003	0.012	0.11
Compressor Seals	0.01940	8	11.40%	0.12%	0.018	0.000	0.001	0.08
Total					0.662	0.047	0.21	2.90

\* Source counts estimated from similar facilities. These counts are not actuals.

Source: EPA Protocol for Equipment Leak Emission Estimates, November, 1995, EPA-453/R-95-017

**Appendix G**  
**Regulatory Analysis**

## Regulatory Analysis

### **40 CFR 60 - New Source Performance Standards (NSPS)**

**Subpart A: General Provisions.** This subpart applies to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication of any standard in part 60. The general provisions under subpart A apply to sources that are subject to the specific subparts of part 60. This facility is not subject to specific subparts of part 60; therefore, the General Provisions of part 60 do not apply.

**Subpart Dc** Standards of Performance for Small Industrial, Commercial, Institutional Steam Generating Units, applies to steam generating units having a capacity between 10 MMBtu/hr and 100 MMBtu/hr that are construction, reconstructed or modified after June 9, 1989. There are no emission units that meet the definition of a steam generating unit at this facility. Therefore, the requirements of subpart Dc do not apply.

**Subpart Kb** Standards of Performance for Volatile Organic Liquid Storage Vessels, applies to each storage vessel with a capacity greater than or equal to 75 cubic meters used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. There are no storage tanks greater than 75 cubic meters that store volatile organic liquids at this facility which vent emissions to the atmosphere, therefore Subpart Kb does not apply.

**Subpart KKK** Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants apply to affected facilities in onshore natural gas processing plants that commenced construction, modification or reconstruction after January 20, 1984. A natural gas processing plant is defined in the Subpart as any site “engaged in the extraction of natural gas liquids from field gas”. This facility does not contain processes which extract natural gas liquids from field gas. Therefore, this rule does apply.

**Subpart LLL** Standards of Performance for Onshore Natural Gas Processing; SO<sub>2</sub> Emissions. This rule applies to sweetening units and sulfur recovery units at onshore natural gas processing facilities. This facility is not an onshore natural gas processing facility. Therefore, this rule does not apply.

**Subpart IIII** Standards of Performance for Stationary Compression Ignition Internal Combustion Engines applies to manufacturers, owners and operators of stationary compression ignition (CI) internal combustion engines (ICE). There are no stationary compression ignition engines at this site, therefore Subpart IIII does not apply.

**Subpart JJJJ** Standards of Performance for Stationary Spark Ignition Internal Combustion Engines applies to manufacturers, owners and operators of stationary spark ignition (SI) internal combustion engines (ICE). This applies to engines that were ordered from the manufacturer after June 12, 2006 and;

- Are greater than 500 hp and manufactured after July 1, 2007 or
- Lean burn engines greater than 500 hp but less than 1,350 hp and manufactured after January 1, 2008

Engines EAB 1 and EAB 2 are lean burn engines greater than 500 hp but less than 1,350 hp that were manufactured prior to January 1, 2008; therefore, subpart JJJJ does not apply to these engines.

**Subpart OOOO** Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution. This subpart establishes emissions standards and compliance schedules for the control of VOCs and SO<sub>2</sub> emissions from affected facilities that commenced construction, modification or reconstruction after August 23, 2011. The rule applies to equipment leaks at onshore natural gas processing plants and compressors. This facility is not a natural gas processing plant and compressors were constructed prior to August 23, 2011; therefore, subpart OOOO is not applicable.

## **40 CFR 61 - National Emission Standards for Hazardous Air Pollutants**

**Subpart V** National Emission Standard for Equipment Leaks (Fugitive Emission Sources). This subpart applies to sources that are intended to operate in volatile hazardous air pollutant (VHAP) service. Based on engineering judgment, historical and recent gas composition and facility process it can be predicted that the percent VHAP content will never exceed 10 percent by weight; therefore Subpart V is not an applicable regulation for the facility.

## **40 CFR 63 - National Emission Standards for Hazardous Air Pollutants (NESHAP)**

**Subpart HH** National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities, applies to glycol dehydration units, storage vessels with potential for flash emissions, and ancillary equipment operating in volatile hazardous air pollutant service that is located at a natural gas processing plant which is a major source of HAPS. This facility is not a natural gas processing plant therefore Subpart HH does not apply.

**Subpart HHH** National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities. This rule applies to natural gas transmission and storage facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user, and that are a major source of HAP emissions. This subpart does not apply to this facility because it does not meet the definition of a Natural Gas Transmission and Storage Facility

**Subpart EEEE** National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline). This rule establishes national emission limitations, operating limits, and work practice standards for organic HAPs emitted from organic liquids distribution operations at major sources of HAP emissions. In this subpart, organic liquids distribution operations do not include oil and natural gas production field facilities as defined in subpart HH or natural gas transmission and storage facilities as defined in subpart HHH. This facility meets the definition an oil and natural gas production field facility as defined in §63.761 of subpart HH. Therefore, this rule does not apply.

**Subpart ZZZZ** National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) establishes national emission limitations and operating limitations for HAPs emitted from stationary reciprocating internal combustion engines, and requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations. This facility is an area source of HAPs; therefore, the facility is not subject to major source ZZZZ requirements. All engines (emission units EAB 1 and EAB 2) at the facility are subject to the August 20, 2010 revisions to MACT ZZZZ for existing units at area sources of HAPs. This facility is by definition a remote sources and will comply with applicable requirements of this regulation.

## **40 CFR 98 – Green House Gas Reporting**

**Subpart A**, General Provisions applies to a facility that contains any source category (as defined in subparts C through JJ of this part) that is listed in this paragraph (a)(2) in any calendar year starting in 2010 and that emits 25,000 metric tons CO<sub>2</sub>e or more per year in combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all source categories that are listed in this regulation. The facility is subject to the reporting requirements of Subpart C and Subpart W.